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Market Street Planning Project

Interim Report

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MUNICIPAL RAILWAY

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WATER AND POWER

SAN FRANCISCO
WATER DEPARTMENT

September, 1984

Members, Market Street Advisory Committee:

In February 1983, the San Francisco Board of Supervisors unanimously adopted Resolution 160-83, amending City policy with respect to the Market Street Beautification Project, to allow:

- Operation of four lanes of transit
- Retention of passenger boarding islands
- Preservation of a surface streetcar operation

The Board further urged the San Francisco Public Utilities Commission to develop the specifics of any streetcar plan and any necessary amendments to the 1968 Market Street Schematic Street Design Plan.

This Interim Report for the Market Street Planning Project represents the first step in what I believe will be the final phase for Market Street reconstruction. It responds to the Board's request to disseminate findings of a 1982 Market Street Design Planning Study while updating those findings based upon current information. The report goes on to highlight issues which remain to be resolved regarding both street redesign and streetcar ('F' Line) operation.

A separate though related Market Street project commenced construction this summer, also guided by policies established by the Board in Resolution 160-83. The "Market Street Guideway Project" will provide a totally new overhead wire system to accommodate expanded trolley coach and streetcar operations. Working with this Advisory Committee, SFPUC and its consultants have designed the "Overhead Project" to be both functional and in keeping with the historic and symbolic character of Market Street.

SFPUC staff have undertaken the 18-month Market Street Planning Project assisted by a technical committee comprised of ten representatives from appropriate City agencies, Ripley Associates urban design consultants and this Advisory Committee. It is hoped that all public steps will be completed and Board concurrence obtained on a final plan in order to move a Market Street capital project to engineering during 1985-86, and finally to construction by 1986-87.

The Project team looks forward to the active support and involvement of this Advisory Committee and of the entire community in achieving that goal.

Rudolf Nothenberg, General Manager
San Francisco Public Utilities Commission

cc: Mayor; Board of Supervisors

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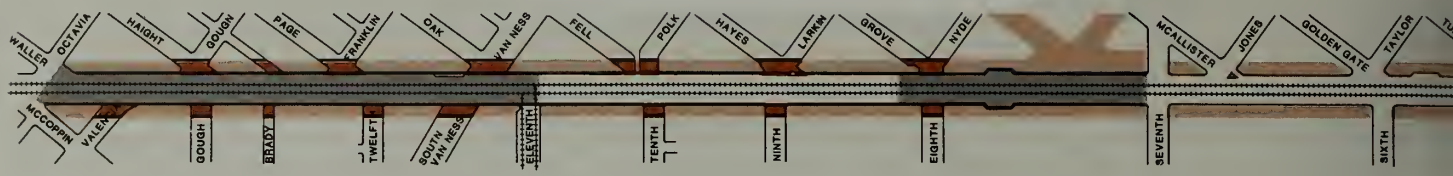
Project Environment

Existing Status

Market Street planning project : interim 1984.



History

The design basis for all street, sidewalk and other elements presently in place on Market Street and in adjacent plaza areas between Steuart and McCoppin Streets derives from the 1968 Market Street Beautification Project. Engineering and construction plans conform to a Schematic Street Design Plan developed by Mario Ciampi, John Carl Warnecke and Lawrence Halprin Associated Architects. The Design Plan in turn, incorporates recommendations for Market Street included in the 1963 Downtown Plan for San Francisco.

As such, "Lower Market" as this portion of the street is called, represents a public works project with over two decades of contemporary history -- a history which continues in flux. There are two reasons for this extraordinary situation:

- o A gradual evolution in City policy brought about by the changing transportation role of Market Street.
- o Insufficient funding over and above the original project scope with which to make desired changes.

A chronology of policy resolutions adopted by San Francisco's Board of Supervisors during this 20-year period traces the City's changing perception of Market Street.

1966 (Res. 663-66)

Adopted the original (post-BART) operational and urban design plan for Market Street.

1968 (Res. 116-68)

Adopted a specific design plan for Market Street and adjacent areas which envisioned the elimination of streetcar and trolley bus service in favor of a linear pedestrian mall and ceremonial way, with minimal vehicular traffic; forwarded a Market Street Beautification Project bond issue referendum to the voters totalling $24.5 million, which was approved.

1978 (Res. 213-78)

Following extensive construction during the early 1970's, the 1968 Plan was revised to permit continued operation of electrically-powered transit vehicles on Market Street, thereby requiring the retention of overhead wires and their support poles.

1979 (Res. 846-79)

Prevented removal of streetcar service by SFPUC prior to Metro subway start-up, and required Board approval prior to any track or island removal from the street.

1981 (Res. 240-81)

Authorized SFPUC to conduct a Market Street Design Planning Study* to investigate the permanent retention of streetcar service on Market Street, and to recommend changes to the 1968 Design Plan.

1981 (Res. 896-81)

Requested SFPUC to create a temporary streetcar service connecting Civic Center to the Embarcadero and Fisherman's Wharf during cable car reconstruction.

1983 (Res. 160-83)

Formally amended policy intent of the 1968 Design Plan to allow for operation of four lanes of transit, retention of passenger boarding islands, and operation of a historic streetcar line; requested SFPUC to develop a streetcar plan and necessary amendments to the 1968 Design Plan for consideration by the Board.

Construction Status

Lower Market Street remained relatively unchanged for nearly a decade, with the last major new construction occurring in 1974-75. This hiatus ended in 1984 with the commencing of construction on the Market Street Guideway Project - Rehabilitation of Trolley Overhead. Scheduled to span an 18-month period, the $15 million "Overhead Project" will remove over 100 wooden and metal poles from the sidewalks of lower Market, and suspend a totally redesigned wire system from existing street light and signal poles for the use of trolley buses and streetcars.

The Street itself remains unchanged from the mid-1970's, major maintenance notwithstanding. Construction completed at that time incorporates the three basic design segments of the 1968 Plan:

*Reference: Market Street Design Planning Study (June 1982), prepared for the Transportation Policy Group of San Francisco by DKS Associates, et al.

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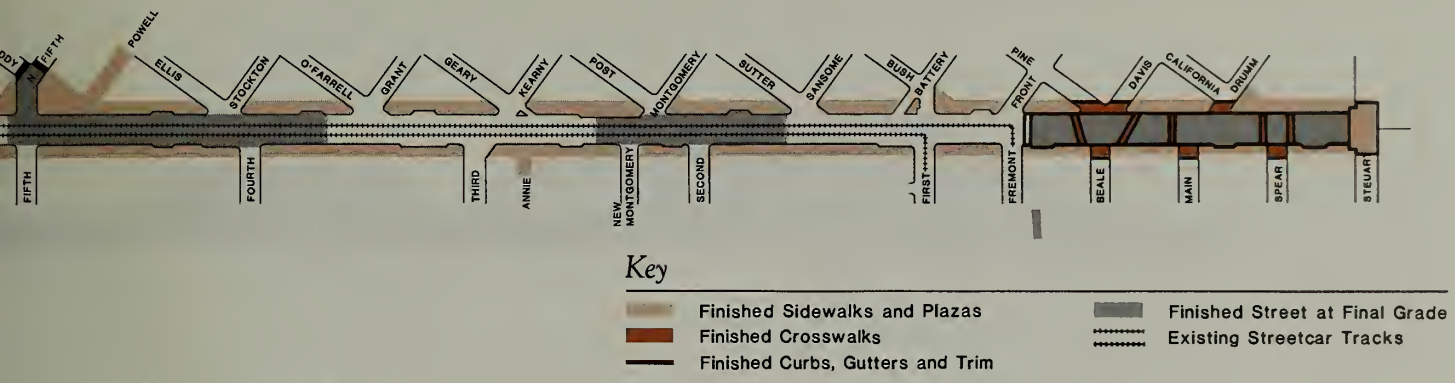


Segment 1: Downtown

This segment encompasses three-quarters of all lower Market Street, from Steuart Street at the Embarcadero to Eighth Street in Civic Center. The Street cross-section along this segment maximizes the pedestrian environment and related amenities. All sidewalks are designed to 35-foot widths, with limited cutbacks for commercial parking and some right turns. The curb-to-curb street width has consequently been reduced to a minimum, varying between 52.5 and 50 feet depending upon the use of temporary (3-3/4") concrete or permanent (18-3/4") granite curbs. Four travel lanes (two in each direction) are accommodated, with no curb parking.

Steuart to Fremont--

All street and sidewalk areas and street furnishings are complete to final design including finished granite curbs and gutters, and brick and granite crosswalks both along and across Market Street. No tracks or islands are included within the street area.

Fremont to Seventh--

All sidewalk areas and street furnishings are complete, although temporary concrete curbs are still in place. Street areas have been regraded and repaved and new streetcar tracks installed in the vicinity of the Montgomery and Powell BART/Metro stations. Most other street area work, including regrading and repaving, finishing curbs, gutters and crosswalks, and installing new streetcar tracks and boarding islands, has yet to be completed.

Seventh to Eighth--

All sidewalk areas and street furnishings are complete, including finished granite curbs and gutters, and brick and granite crosswalks are in place along Market at Eighth. Street areas have been regraded and repaved, and new streetcar tracks have been installed. Finished crosswalks across Market and boarding islands have yet to be completed along this block.

Segment 2: Civic Center / Van Ness

Stretching between Eighth and Twelfth Streets (near Van Ness), this segment of lower Market is designed to be transitional, connecting the downtown to the neighborhoods. The pedestrian environment remains generous with sidewalks built to 26-foot widths. No cutbacks are included. The curb-to-curb street width expands to 68 feet, allowing six travel lanes at present with no curb parking.

All sidewalk areas and street furnishings are complete, including finished granite curbs and gutters, and brick and granite crosswalks along Market (except at Eleventh Street). The street area has been regraded and repaved, and new (temporary) streetcar track installed between Eleventh and Twelfth Streets. Most other street area work, including regrading and repaving, finishing crosswalks across Market and at Eleventh, and installing new streetcar tracks and boarding islands, has yet to be completed.

Segment 3: Neighborhood Commercial

The western extremity of lower Market extends from Twelfth to McCoppin Streets. This portion of the Street is, by virtue of its surroundings, more similar in nature to "Upper Market" to the west than to the remainder of Market Street to the east. It is included as part of the 1968 Project perhaps due to the imposing structure of the Central Freeway overpass at McCoppin.

In any event, this section of Market Street is constructed to dimensions which were repeated almost precisely by the recently completed "Upper Market Street Beautification Project." Sidewalks are 16 feet wide, with bulbs extending eight feet at McCoppin, a pattern repeated at intersections west to Castro. Street width expands to 88 feet (72 feet at the bulbed intersection), and at present accommodates four travel lanes, two curb parking lanes and a 21-foot exclusive right-of-way for streetcar tracks, and left-turn lanes at Franklin and at Valencia.

All sidewalk areas and street furnishings are complete, including finished granite curbs and gutters, and brick and granite crosswalks along Market. The street area has been regraded and repaved, and new (temporary) streetcar track installed. Finishing crosswalks across Market Street and installing boarding islands, if any, has yet to be completed under existing street geometrics. The possibility of revising street area geometrics and track alignment in conformance with plans adopted for Upper Market Street remains to be determined for this segment.

Project Environment

Urban Design Objectives

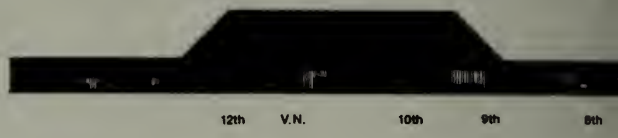
Market Street first served as a link between the waterfront and Mission Dolores with development concentrated at its west end. The construction of the Ferry Building in 1875 prompted development along what is now the city's dense financial district. With the 1906 earthquake, grand urban design schemes were set aside as the city turned to immediate construction problems. Inspired by the decision to construct BART, an urban design plan was developed in 1963 and the revitalization of Market Street began anew following adoption of a Schematic Street Design Plan in 1968.

The 1968 Plan foresaw Market Street passing through a downtown with four districts identified along its length. Moving west from the Bay: the financial district was to extend from the Ferry Building to a Grant Avenue mall; the retail district from Grant to a Powell Street mall; the hotel/entertainment district from Powell to Jones; and the Civic Center west to Van Ness Avenue focused around a Fulton Mall and Plaza. Unprecedented development and changes in land use were also proposed for the areas south of Market and in the Tenderloin as part of these plans.

Twenty years later, only portions of this grand urban design plan have been achieved. The financial district has most fully realized its planned development, followed by the retail district adjacent to it. South of Market, even in the financial district, has resisted change most effectively, as has the Tenderloin. The Civic Center has recently accelerated its pace of development, particularly along Van Ness Avenue.

The completed public elements of the plan -- subway entrances, plazas and sidewalks -- have characteristics appropriate to the uses planned for each segment of the street in 1968. The 35-foot sidewalks east of Eighth, for instance, have been completed in distinct design configurations corresponding to the four planned districts.

Many changes have occurred along Market Street since the original revitalization began in 1968. Some of these changes have been for the better, some not. Ongoing development is nevertheless adhering to the principles of the 1968 urban design concept. Fortunately, those principles have been strong enough to accept the changes in pace and nature of growth which have actually transpired. Development in the future must continue to achieve these principles which support Market Street as a circulation artery, a great urban boulevard and an intense and lively concourse for human activity.



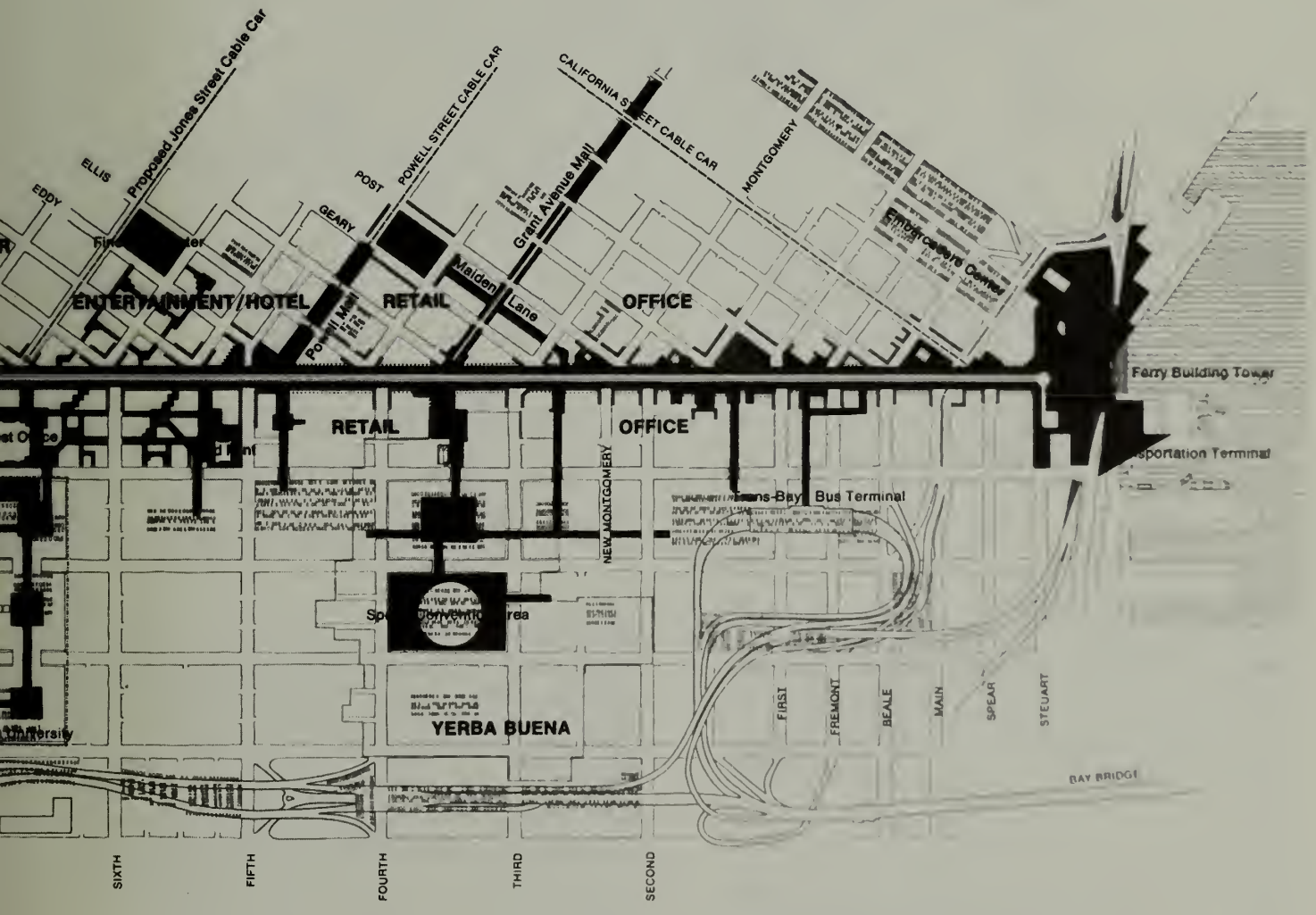
Physical Form

Comprehensive Sketch Plan

Present or Planned Building Heights

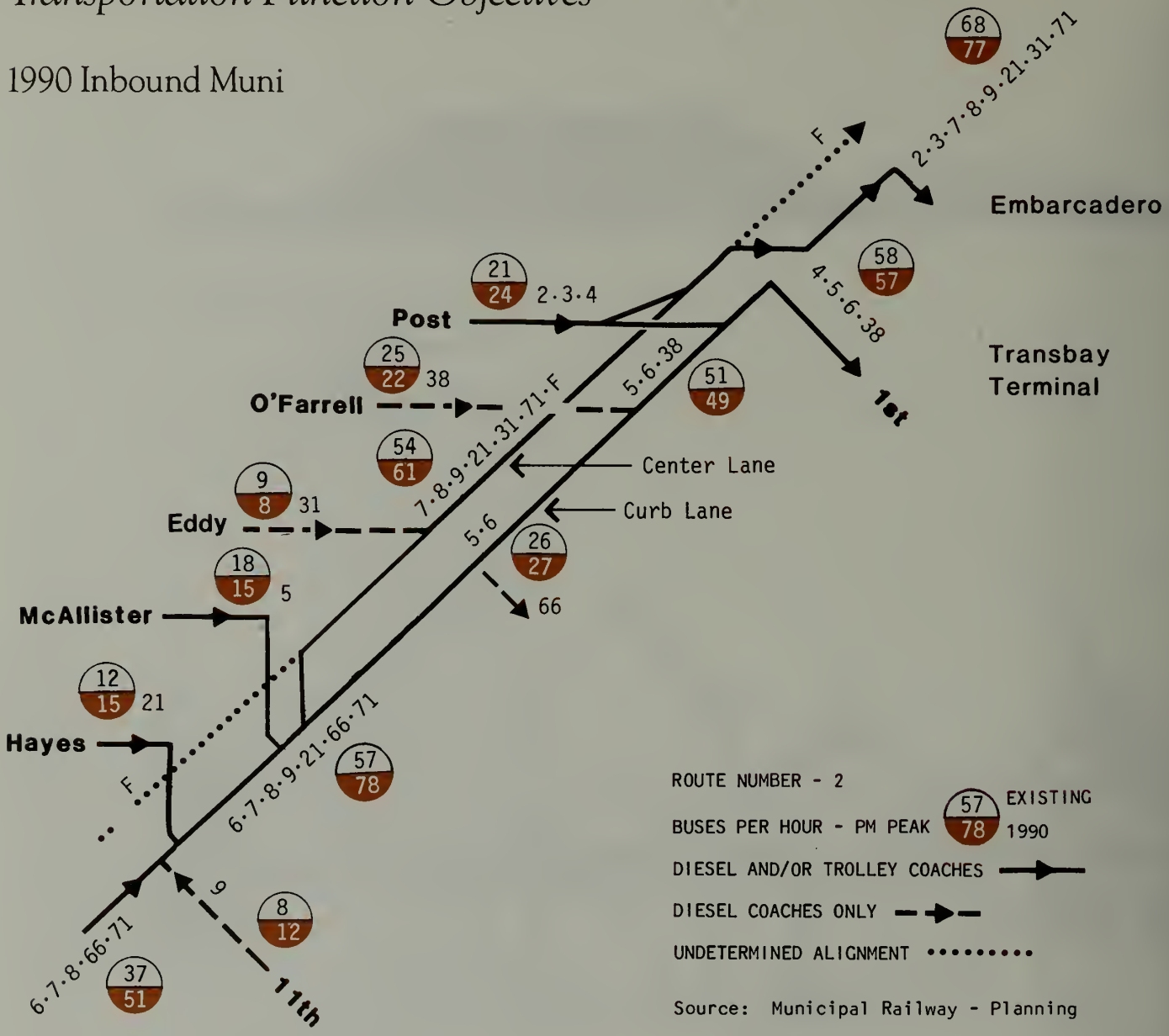
North side

South side



Transportation Function Objectives

1990 Inbound Muni



In February 1983, the Board of Supervisors unanimously resolved to amend policy intent of the 1968 Market Street Design Plan based on a changed perception of the street's transportation function. A greatly expanded Muni surface operations plan underlies this change in policy. Formal action followed prolonged reevaluation of Market Street's evolving traffic, pedestrian and transit circulation characteristics.

Traffic

According to Department of Public Works cordon counts, lower Market Street presently serves a relatively minor traffic circulation function, with average daily volumes ranging between 10,000 and 18,000 vehicles per day. (This compares to 50-55,000 vehicles per day on Van Ness Avenue, for example.) Trucks and other service vehicles represent less than six percent of this vehicular traffic.

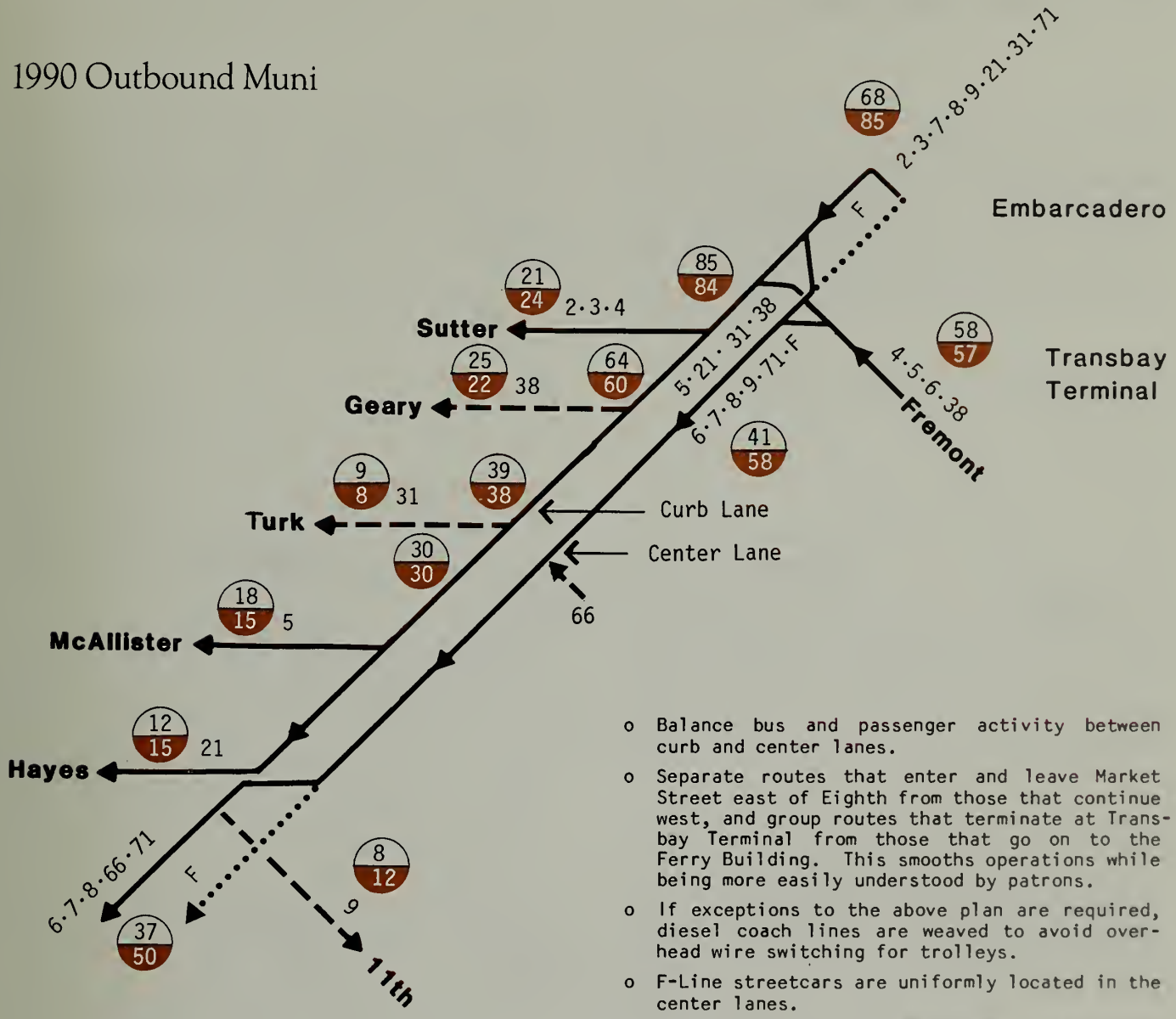
Pedestrians

Lower Market is a densely utilized pedestrian corridor, supporting local and regional rapid transit services along an axis which interconnects San Francisco's financial, retail and governmental activity centers. Completed elements of the 1968 Plan, notably wide, tree-lined sidewalks, are ideally suited for this role. During the noon hour, pedestrian volumes routinely exceed 4,000 persons per hour past a given point in the vicinities of Montgomery and Powell Streets.

Transit

Market Street's preeminent role is as the highest transit-use street in the City. In addition to the two-level BART/Muni Metro subway network, the street presently carries portions of 17 Muni surface routes. A total of up to 100 transit vehicles per direction per hour operate during peak

1990 Outbound Muni



periods. All routes have eastern termini at either the Transbay Terminal or near the Ferry Building adjacent to Embarcadero Center, and serve neighborhoods throughout central and western San Francisco as well as downtown itself. Planning statistics indicate that over one-third of Muni's 750,000 daily patron trips travel on or under Market Street at some point. Muni's current Five-Year Plan calls for further increases in these totals, with 1990 transit ridership on Market expected to increase by as many as 21,000 daily trips.

To accommodate these increases and improve existing service, Muni Planning proposed and the Board adopted by policy resolution a four lane configuration for surface transit operations east of Eighth Street. The assignment of transit service in both lanes in both directions lowers concentrations of bus volumes and passenger loading activity by distributing them between curb and island stops. Specific route allocations were determined using the following criteria:

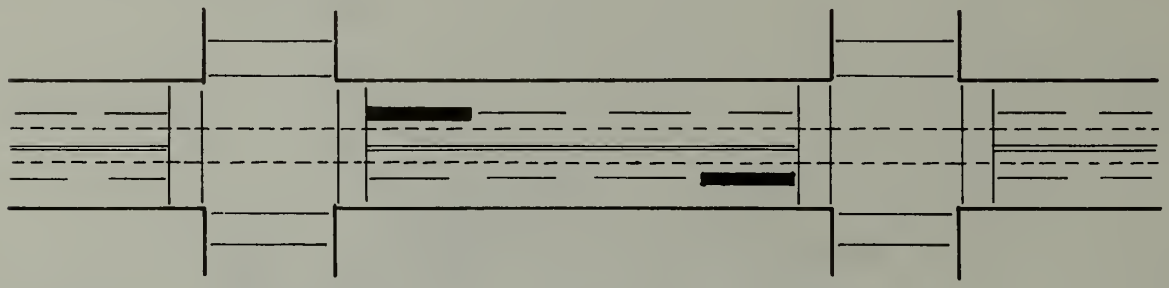
- o Balance bus and passenger activity between curb and center lanes.
- o Separate routes that enter and leave Market Street east of Eighth from those that continue west, and group routes that terminate at Transbay Terminal from those that go on to the Ferry Building. This smooths operations while being more easily understood by patrons.
- o If exceptions to the above plan are required, diesel coach lines are weaved to avoid overhead wire switching for trolleys.
- o F-Line streetcars are uniformly located in the center lanes.

Market Street has been designated as a transit preferential street in the City's Master Plan since 1971. The just-completed Downtown Plan for San Francisco and its associated EIR identifies Market Street (Van Ness to Steuart) as the top citywide candidate for conversion to a Transit/Commercial Mall. Functioning as a mall, regional transit carriers such as Samtrans and Golden Gate could be permitted to use Market Street in conjunction with Muni. The street's wider sidewalks and minimal auto conflicts are cited as features enhancing combined transit operations without disrupting downtown pedestrian or traffic circulation. The EIR concludes that "this would result in better visibility for all carriers and could increase ridership by being more conveniently located for users."

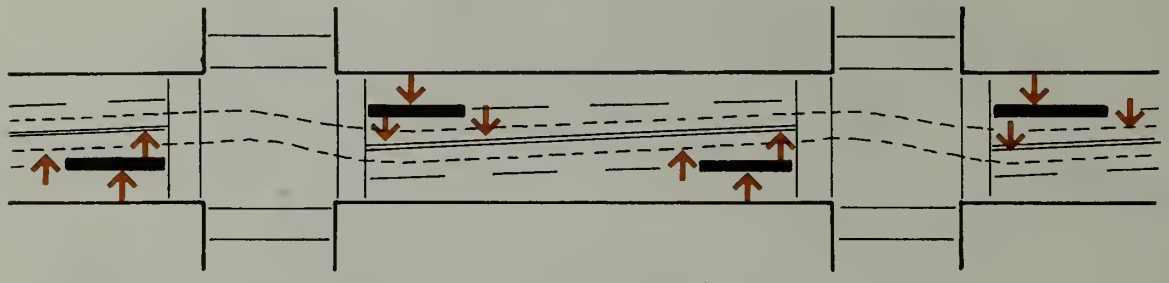
Finally, the Downtown Plan calls for implementing the 'F' streetcar line on Market in conjunction with the 'E' Embarcadero line. Together, they would provide service between major activity centers along Market and the developing northeastern waterfront, with daily 1990 ridership for both estimated at over 23,000, and built-in capacity for twice as many in the future.

Market Street Design Recommendations

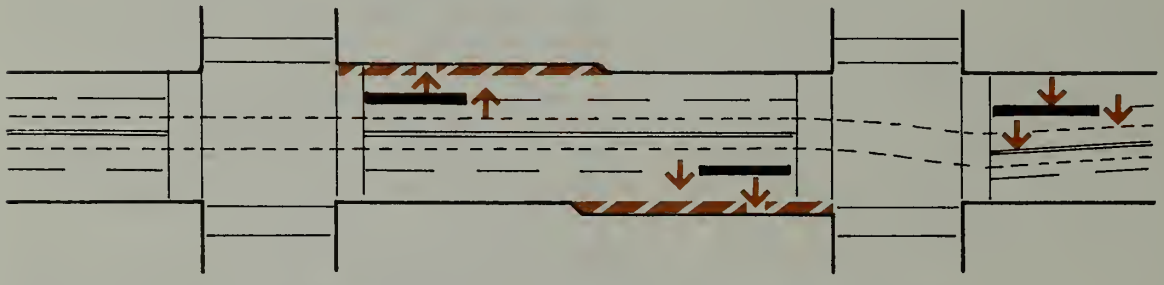
Street Area Geometrics



Existing Streets (Fremont to 7th)



Alternative A (with streetcars—weave all tracks)



Alternative B (with streetcars—keep good track/weave all tracks)

Islands
Streetcar tracks
Traffic lane markings

Source: Market Street Design Planning Study

Board Resolution 160-83 calls for the development of "...necessary amendments to the 1968 Market Street Schematic Street Design Plan..." The primary objective of Phase I of the Market Street Planning Project (Phase II being the 'F' Line Streetcar) is therefore, the redesign of Market Street's surface space and related street elements.

Street plan design revisions must address two primary criteria within the context of adopted policy:

1st - The existing status and environment of the street
2nd - The street's transportation function, as recently redefined

The key change in transportation function calls for facilitating the movement of large numbers of transit vehicles in all four travel lanes east of Eighth Street. It is therefore appropriate to focus on the curb-to-curb street cross section followed by all other elements.

But decisions about the street area have a direct impact on the curbs and sidewalks, most of which are essentially in place. And boarding islands affect both. The 1968 Design Plan did not include islands, and developed a final street cross section of 50 feet for four moving traffic lanes only. With the inclusion of islands, the street must be "retro-fit" to accommodate their added width within a cross section defined by millions of dollars of completed sidewalks, relocated utilities, rapid transit entrances, ventilation shafts, and so on.

The Market Street Design Planning Study and its consultants, DKS Associates, conducted an extensive review of street plans which did not require retention of boarding islands. They concluded that islands would be required to accomplish Muni's planned operational improvements, and the Board subsequently endorsed that position. To have done otherwise would have frozen Market Street's transit capacity at today's levels.

Given this decision, DKS Associates examined three alternative designs for street geometrics: two with streetcar tracks and one without. (The alternative without tracks was discarded following Board action to retain streetcars on Market.)

Existing Street

Market Street's curb-to-curb cross section between Fremont and Seventh totals 52'-6". This is wider than the 50' final section designed by the 1968 Plan, and in place between Steuart and Fremont and Seventh and Eighth. The difference derives from the absence of finished granite curbs, each of which extends 15" further into the street than do the "temporary" concrete curbs between Fremont and Seventh.

Travel lanes in the latter section are 14' at the curb and 12'-3" in the center both ways--totally adequate by traffic engineering standards. However, the presence of boarding islands consumes 5' of street cross section. As a result, lane widths adjacent to islands shrink to 10'-9" curbside and 10'-6" in the center. The curb lane width is particularly unacceptable due to the lack of maneuvering room for traffic between two curbs: one along the island and the other along the sidewalk.

The challenge addressed by DKS was three-fold:

1. Widen the curb lane adjacent to islands to dimensions acceptable for traffic circulation

2. Widen islands for the safety and convenience of transit passengers

3. Avoid sidewalk narrowing if possible

Alternative A

The design alternative which accomplishes all three objectives, and the preferred alternative of DKS Associates, expands the curb lanes and islands inward toward the street's center. By staggering island locations to permit inward expansion, a weaving pattern is introduced to the center lanes and streetcar tracks adjacent to the islands.

Given this approach, sidewalk narrowing is only required in exceptional circumstances, and a uniform street pattern results. Alternative A presumes replacement and realignment of all streetcar tracks on Market along with associated resurfacing throughout. This includes track installed by BART in the vicinity of the Montgomery, Powell and Civic Center Stations, where streets have been rebuilt and repaved to their final grade.

Alternative B (DKS Alternative C)

In an attempt to reduce costs associated with the project, DKS Associates developed a second alternative with streetcar tracks. It differs from Alternative A only in the vicinity of the Montgomery, Powell and Civic Center stations where new rail was placed by BART and streets are at their final grade. In these locations, tracks would not be replaced and realigned into a weaving pattern. Rather, the increased width for islands and adjacent curb lanes is obtained by expanding away from the center of the street and into the sidewalk by cutting back the curb line.

Calculations by DKS show that this alternative, although disruptive to finished elements of the 1968 Design Plan, would nevertheless be less costly.

Market Street Design Recommendations

Street Area Geometrics

DKS Associates developed prototype street plans for representative block sections in order to detail the features of each of their design alternatives. In developing these plans, they were required to conform to minimum standards and other criteria established by the City's Transportation Policy Group at that time. These criteria have recently been updated by the Department of Public Works in conjunction with the Market Street Planning Project's Technical Advisory Committee.

Curbside Travel Lanes

Transit vehicles, trucks and passenger cars all require comfortable and safe operating space adjacent to the curb. Since passenger loading islands will be provided, curb travel lanes must be placed between sidewalk curbs and passenger loading island curbs. To allow adequate room for emergency equipment and trucks to maneuver into and out of curb lanes from cross streets and to provide adequate room for heavy bus operations, curbside travel lanes should be a minimum of 12 feet wide. Where the curb lane is on the opposite side of the street from a passenger loading island, an 11-foot travel lane is acceptable for the length of the island.

Center Lanes

For streetcar operation, the minimum dimension for both center lanes to accommodate eastbound and westbound tracks is 21 feet (10.5 feet in each direction). But for the added safety of trolley and diesel coaches also operating in the center lanes, lane widths should be a minimum of 11 feet in each direction, except for the necessary (6 inch) encroachment by the loading island.

Boarding Islands

Passenger boarding islands on Market Street should be six to seven feet wide compared with their present width of just five feet (see discussion pp. 14-15). Islands provided in the westbound direction should be seven feet and islands in the eastbound direction should be at least six feet wide. Island stops should always be located on the near (approach) side of intersections, and should never be located adjacent to one another to reduce the need for street widening. Island stops also cannot infringe upon the air space of BART ventilation shafts.

Other

Lane line transitions (weaving) - Maximum transitions for lanes shifting laterally consistent with traffic safety should not exceed one foot in fifteen (1:15).

Right turn only lanes - Minimum lane width for right turning traffic should be 10 feet. The adjacent through curb lane minimum width may be reduced by one foot (e.g., 11' vs 12').

Sidewalk narrowing - As already mentioned, redesign of the street area is to be done in such a way as to avoid expanding the overall curb-to-curb cross section if at all possible.

Second to Third Streets

DKS Associate's Alternative A Street Design Plan, shown at right as revised, meets or surpasses these criteria with only minor exceptions.

Alternative A removes all existing tracks as installed by BART from east of Second to west of Third. The new center lanes and tracks weave across Third Street to accommodate the proposed islands. Eastbound between Third and New Montgomery there is no island. Therefore, the travel lanes and tracks in both directions remain in their southward alignment without weaving, accommodating the outbound island at Montgomery accordingly.

East of Second Street, the BART vent structure prohibits a weaving section around the proposed inbound far side island.* In this exceptional case, the inbound tracks must be moved south 9 inches to provide a 5 foot distance between the track centerline and the edge of the island curb flush with the vent, and the south side sidewalk narrowed 3 feet adjacent to the BART entrance to provide a 12 foot curb travel lane.

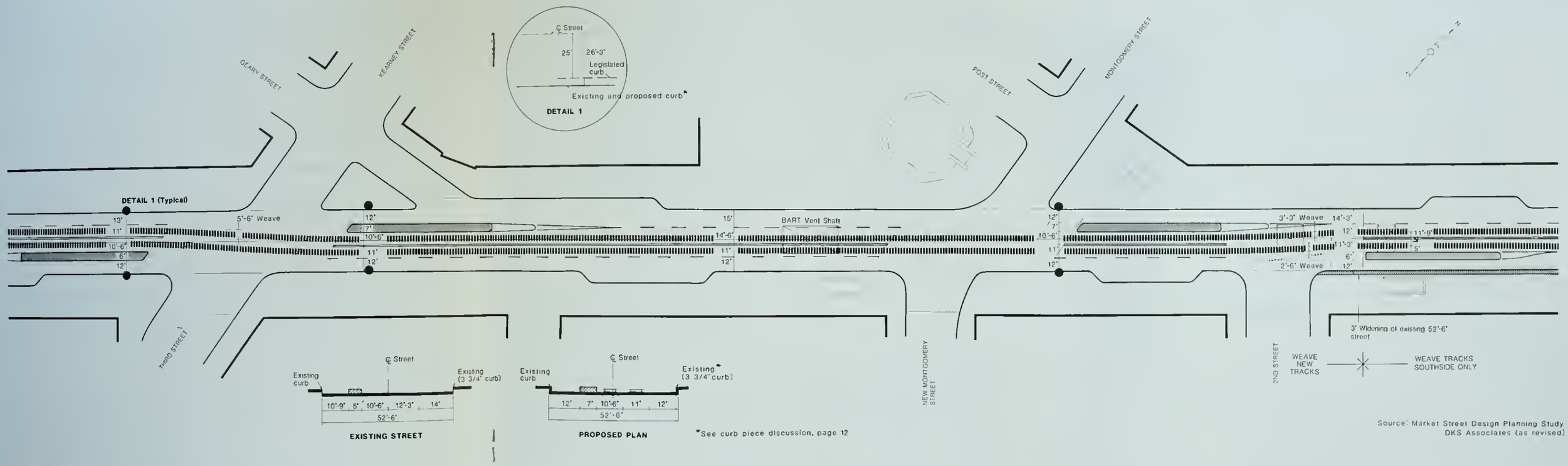
Existing curb alignments along the remainder of this section of Market Street remain intact under Alternative A, notwithstanding separate decisions regarding the depth of the curb piece itself (see discussion p. 12).

Alternative B, which retains tracks installed by BART, results in a required 4-foot narrowing of north side sidewalks adjacent to the two outbound islands at Montgomery and at Third, including the right turn lane leading to Geary. This is necessary in order to permit 7-foot islands and a 12-foot curb lane. Due to the coincidence of the inbound far side island at Second with the BART vent, Alternative B requires the same track and south side sidewalk narrowing as Alternative A.

West of Eighth

DKS Associates developed prototype Street Plan alternatives for the block between Eighth and Ninth as well. These were intended to highlight differences between the design section illustrated to the right and the 68-foot section in place between Eighth and Twelfth. However, based on updated Department of Public Works criteria, the six lane plan developed by DKS for this section using 10-foot lane widths is no longer valid. Further, a recommended street design plan for Market Street between Twelfth and McCoppin was never developed.

*Note: This is an exception to the near side rule.



Source: Market Street Design Planning Study
DKS Associates (as revised)

Proposed Alternative A
Second to Third

Market Street Design Recommendations

Sidewalk/Curb Area

The great majority of sidewalk area construction was completed during the early and mid 1970's consistent with the 1968 Design Plan. During the intervening decade of use by the community and upkeep by the City, a number of lessons have been learned and perceptions changed regarding many of the elements in place.

Transit Shelters

The so-called 'T' shelters installed as part of the original project have not functioned well for a variety of reasons, not the least of which being Muni's relocation of a number of stops to alternative sites. The T shelters require massive foundation supports and are not easily moved.

Two basic alternatives are available from which to choose:

1. Redesign the 27 existing 'T' shelters, relocating those which are no longer at Muni stops.

2. Replace the 'T' shelters with new custom designed shelters at all Muni stops.

The following criteria apply to either alternative solution:

- Improve weather protection by adding panels on at least two sides
- Facilitate security and functionality by using transparent glass panels with at least two exit routes
- Employ materials and design standards already in use on the street to ensure visual consistency
- Provide seating and improved route and schedule information for transit riders

Final Market Street shelter design will complement a separate PUC transit shelter program being established for other Muni routes. The citywide shelter program, scheduled to begin in 1985, will require a private firm to erect and maintain shelters, according to contractually-stipulated design and performance criteria. Shelter design must be compatible with the city's unique environment and be approved by the Art Commission. All new transit shelters, including those along Market Street, will require minimal foundation work so that they can be easily moved should stops be relocated in the future.

Crosswalks, Curbs and Gutters

As designed and partially installed in the original project, the granite-trimmed brick crosswalks and granite curbs and gutters are integral design elements within the total street plan. Ten years of experience, however, indicate that failures occur routinely with certain components of each. Redesign of these elements must therefore alleviate the break-up problems while retaining the street's design integrity.

While still tentative, the following criteria have been developed by the Technical Advisory Committee relative to the original design parameters (see drawing):

A. Curb realignment may occur east of Eighth Street, and will be determined by street area design decisions. Where finished 18-3/4" granite curbs are already in place as shown, they should be left intact if at all possible. Between Fremont and Seventh, the 3-3/4" concrete curbs define a 52'-6" street width. Presuming this as a maximum uniform width, final curbs could be installed in granite or concrete to the 3-3/4" dimension without intrusion into the brick. A 12" curb piece could be obtained by removing the first row of "soldier course" brick. A narrower street width permits curb piece widening without brick intrusion.

B. All handicap ramps from Eighth Street east should be entirely within the sidewalk area. This requires rebuilding finished ramps so they do not protrude into gutter areas as shown.

C. All gutter treatments from Twelfth Street east, both finished and yet to be installed, should be narrowed from four rows to two or by an equivalent dimension. New sections should install textured granite or concrete strips in lieu of smaller paver blocks.

D. Catch basins should be relocated if necessary, so they are even with the face of the curb.

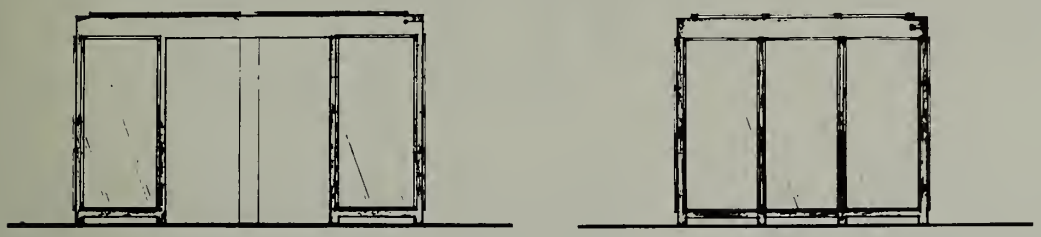
E. Based on its experience with installation and maintenance, the Department of Public Works recommends that brick and granite patterns be maintained for all new crosswalks, but that "less expensive, more durable materials" be substituted. What those materials should be remains an open question.

F. Due to damage caused by traffic, all curb signage should be uniformly set back an additional 6-12" from the curb. Because porcelainized signals and signage with special heads and poles are not available or are too expensive to fabricate, they should be replaced upon relocation with standard, high quality signage on metal poles painted to conform to finished Market Street colors (e.g., olive green or black).

G. Fire hydrants appear to be adequately set back and should not be relocated unless additional curb face modifications require it.

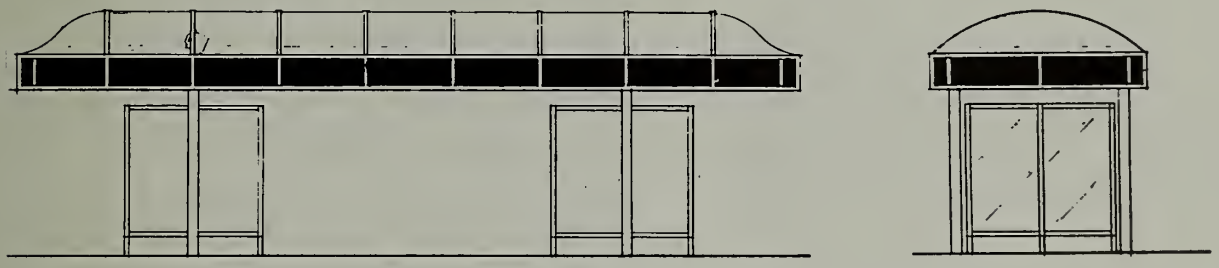
Other Street Furniture

In addition to major maintenance where needed, there is concensus that the existing bicycle holders should be removed, and that information kiosks must be modified either in design or operation or both. These and other issues should be resolved in concert with interested neighborhood, business and civic organizations.



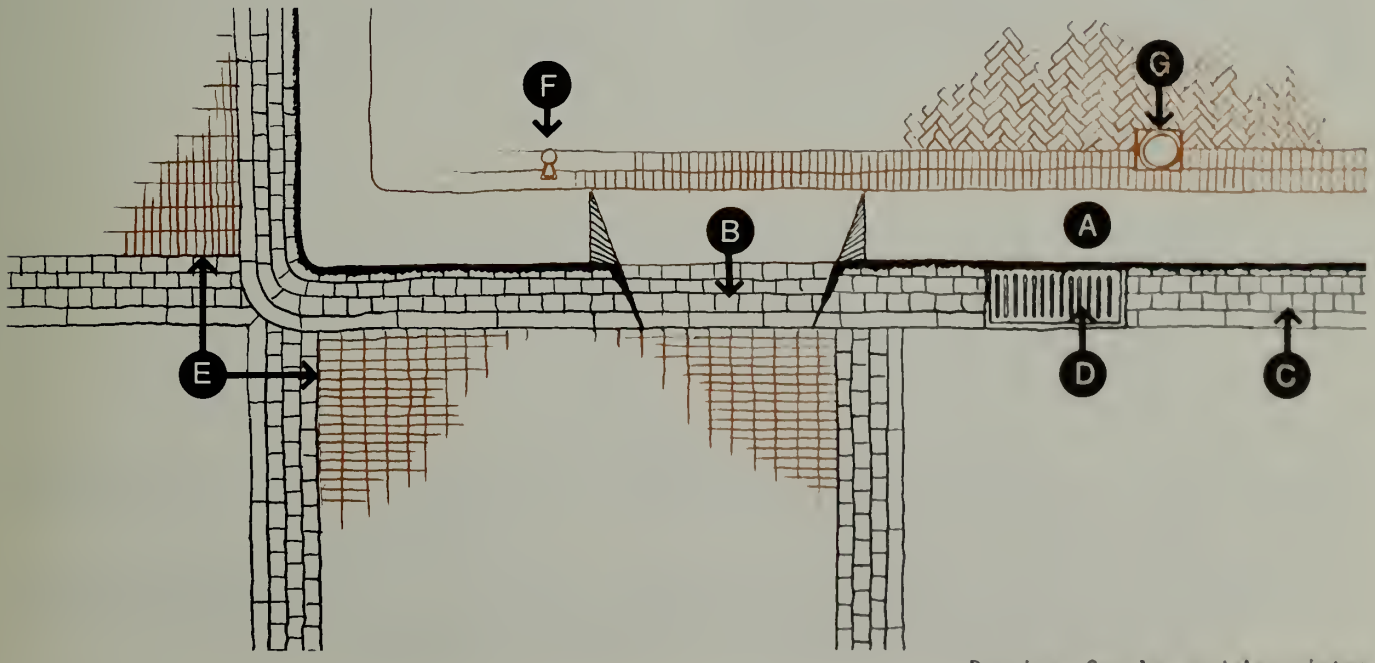
Redesigned 'T' Shelters

Source: Market Street Design Planning Study



New Replacement Shelters

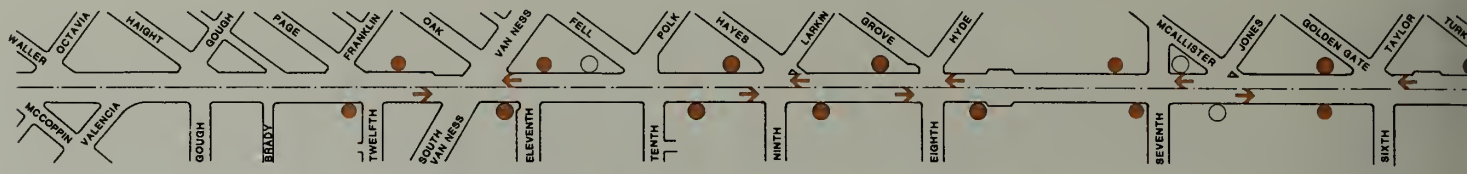
Source: Urban Systems "Streetscape, Inc."



Drawing: Gensler and Associates

Market Street Design Recommendations

Boarding Islands and Curb Stops



With four lanes of parallel transit operation east of Eighth Street, the Market Street Design Planning Study determined that passenger boarding islands would be required regardless of whether or not streetcar service remained. Criteria for the redesign and relocation of boarding islands as well as the relocation of curb stops were therefore developed and recommendations made for all plan alternatives.

Boarding Island Design

Width - Island widths compromise passenger comfort when controlled by physical street size constraints. Wide islands with liberal standing areas require widening Market Street's cross section. By expanding islands from their present 5-foot width to 6 or 7 feet, the street cross section does not need to be increased given weaving of adjacent traffic and transit vehicular lanes.

Length - Island lengths should provide a comfortable passenger waiting area and be capable of serving two stopped transit vehicles simultaneously. Two articulated buses, which will be the longest vehicles to be served, require 110 feet of lineal curb space for loading.

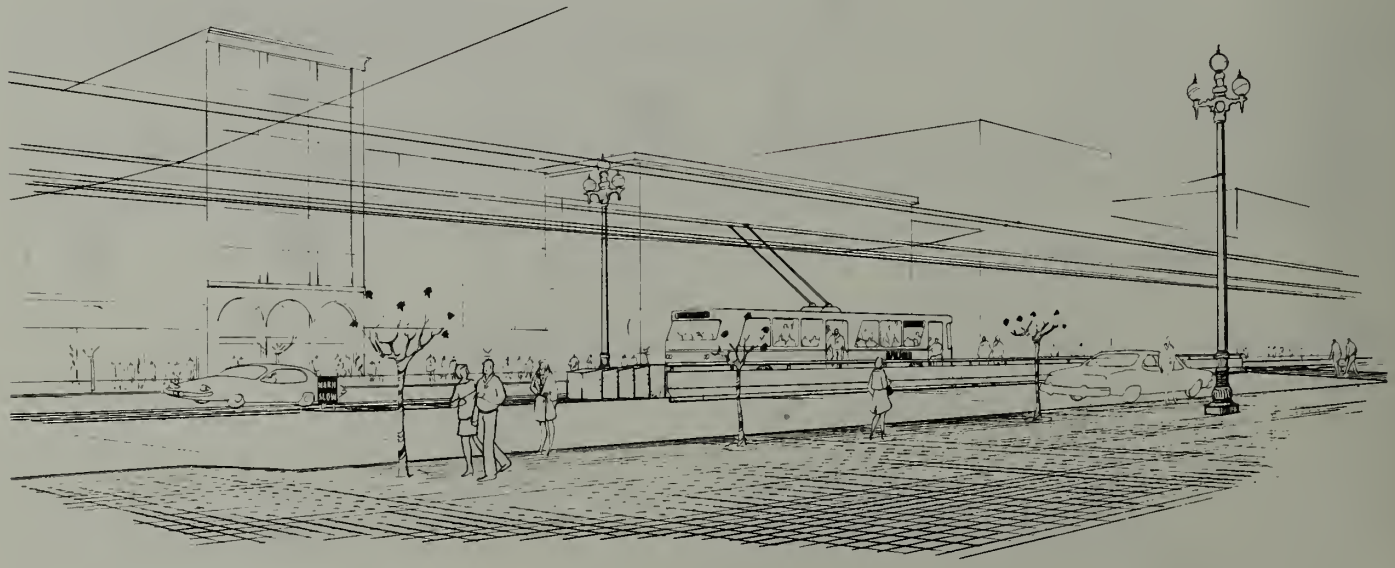
Passenger Comfort - Data was analyzed to establish passenger comfort conditions during peak loading. Based on projected ridership and vehicle headways for routes assigned to the center lanes, a maximum accumulation of persons was assumed for an outbound island during the evening peak. Given a 7-foot width and 110-foot length, adequate space would be provided for necessary movement under these assumptions.

Safety - Placing structures and pedestrians in a street right-of-way is inherently unsafe. In order to minimize the dangers to pedestrians, transit passengers and motorists alike, observation and enforcement of existing laws is of paramount importance:

- The California Vehicle Code (Sec. 21756) restricts vehicular speeds to 10 mph when passing a transit vehicle loading passengers at a safety zone (e.g., island).
- Marked crosswalks at signalized intersections provide safe pedestrian passage from curb to island in every case.

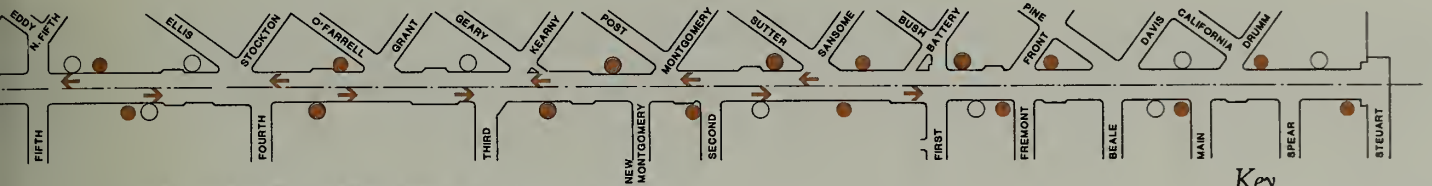
Other design elements enhancing safety include curb lane width, island barriers and driver safety features:

- Increased island width reduces overcrowding and the risk of being forced off and into a traffic lane. A corollary factor is the widened curb lane, which itself serves to spatially separate vehicular traffic from pedestrians on islands.



Near Side "Barriered" Island

Source: SFPUC - Utilities Engineering Bureau



Source: Market Street Design Planning Study

Key

- ← Proposed Island Stops
- ● Proposed Curb Stops
- ○ Existing Shelters

- o To deter jaywalking and to prevent overcrowding from forcing patrons into the curb lane, curb-side pedestrian barriers may be installed on islands. This measure nevertheless consumes valuable island width, and can serve to limit movement of pedestrians in various ways.

- o To reduce the hazards of loading islands to motorists, lane dividers, driver - alerting pavement textures, signs and other "passive" safety features should be developed. Should pedestrian barriers be constructed on islands, "impact attenuators" must also be incorporated to protect motorists from head-on collisions.

Appearance - Since passenger boarding islands were not part of the original 1968 Design Plan, they should be designed to blend into the existing streetscape. Construction materials as well as form and mass should conform with other completed street elements. A "non-barriered" island design (curb height platform with passive safety features) may be pursued in part to reduce visual impacts. More massive elements which actively protect pedestrians and motorists may, on the other hand, be incorporated uniformly at the outset or be phased in on a site-specific basis to address unique situations.

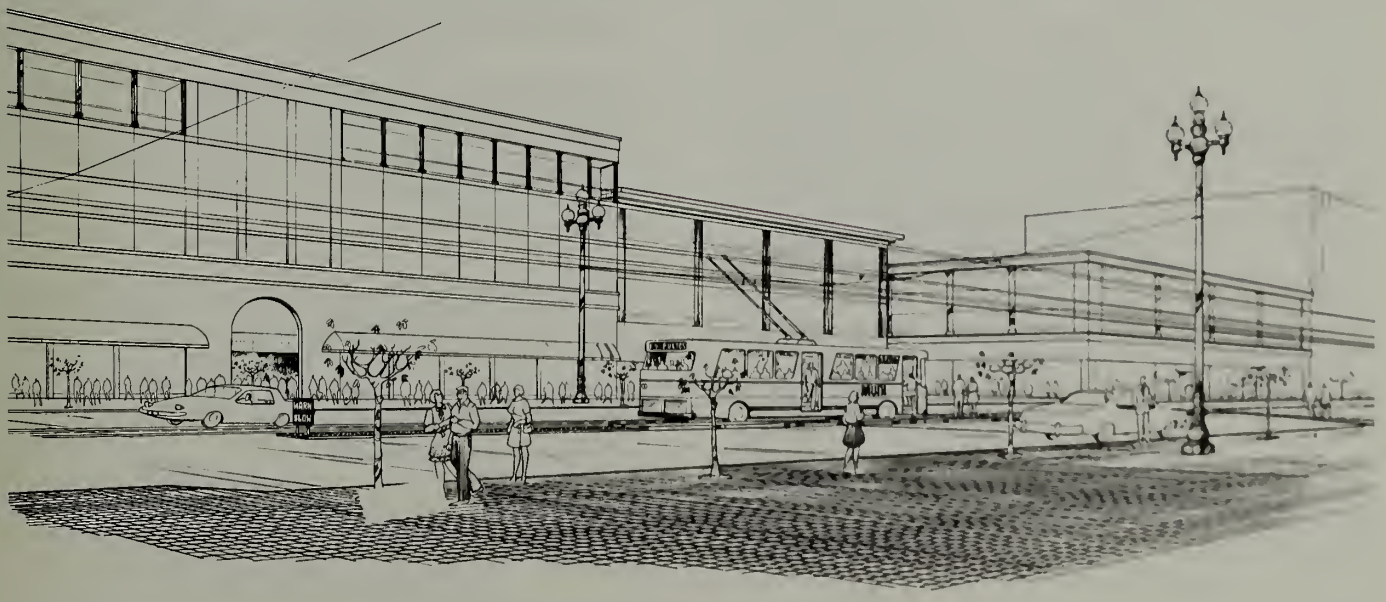
Island and Curb Stop Relocation

The proposed transit operating plan for Market Street places special emphasis on improved service reliability and freedom from delay. Relatively small improvements, when spread over vast numbers of riders, can pay large returns in both time and cost savings.

Muni's Planning Department has proposed to locate all curb and island stops, in both directions to the degree possible, along near (approach) side block faces of all numbered street intersections from First to Van Ness. All stops would then be arranged symmetrically, with generally one minute travel time spacing from stop to stop. This in turn allows for directionally symmetrical signal timing with only minor changes, permitting minimum delays to transit vehicles. Passenger loading would take place during the signal's red phase, with the green phase permitting transit vehicles time enough to travel to the next stop, allowing for routine delays and mid-block intersections.

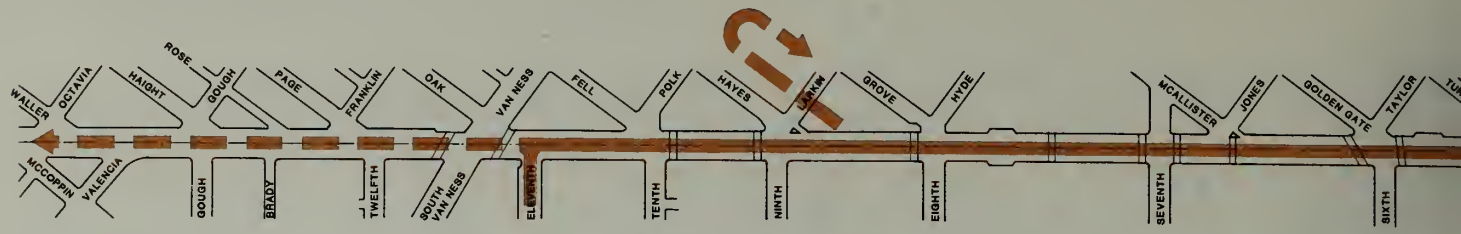
In the plan shown above, islands are placed at the near-side crosswalk in nearly every case. However, curb stops generally trail behind on the same block face. This permits a staggered pattern of transit stops, and allows other traffic to bypass loading Muni vehicles.

Resulting transit travel times between Main Street and Van Ness Avenue may be reduced by between four and eight minutes according to Muni Planning calculations -- a 20-40% improvement over present service.



Near Side "Non-Barriered" Island

'F' Line Streetcar Recommendations



Board Resolution 160-83 calls for the development of "...the specifics of any streetcar plan..." The Phase II objective of the Market Street Planning Project is to recommend a long range plan for 'F' Line streetcar operations on Market Street along with an examination of related issues.

Background

Market Street has traditionally had guideway facilities for streetcar operation. Rail cars ran on Market for 122 years prior to their removal in 1980, making it the longest continuously operated rail service on a main street anywhere in America. With the phased introduction of Muni Metro subway service during 1980 and 1981, streetcar service was discontinued from the surface of Market Street.

The decision to eliminate streetcar service was influenced by the 1968 Design Plan for Market Street which envisioned the underground Muni Metro as an upgraded replacement service. Therefore, the removal of streetcar tracks and boarding islands, along with shifting most surface transit (trolleys and buses) to Mission Street was assumed by architects and engineers who laid out the original street plans. Yet, between 1965 and 1980 approximately 25 million square feet of office space was added in the downtown area. The downtown's retail core flourished as well, and tourism continued to grow.

Increasing ridership demand generated by these developments together with other circulation constraints rendered impractical any proposal to route surface transit onto Mission Street. Four years after opening, Muni Metro is carrying nearly twice the daily ridership (125,000 vs 70,000) carried by earlier streetcars, and cannot accommodate additional trips during peak periods. Projected growth in downtown employment will be served by increased Metro capacity planned to result from a turn-around loop and other improvements.

The Board recognized these trends, first by acting in 1978 to retain all surface routes on Market, and resolving in 1983 to expand transit to a 4-lane operation including historic streetcars.

Community interest was again stirred to retain streetcar service on Market Street in the summer of 1983. Through the auspices of the San Francisco Chamber of Commerce in cooperation with Muni, a "Historic Trolley Festival" was launched using streetcars of various ages and origins. Billed as a one-time replacement for the cable cars which were then undergoing rehabilitation, the festival quickly gained the support of many elements of the community as exhibiting the potential for full time operations. In 1984, the Festival began operations to even greater community acclaim, and this time in conjunction with the cable cars.

San Francisco has apparently rediscovered its love affair with streetcars on Market Street.

Function

The benefits to be derived from a historic streetcar service along Market Street are augmented by the Board's concurrent 1983 policy resolution to integrate it with the proposed 'E' Embarcadero streetcar line. A merged E/F service would provide the following public transportation functions:

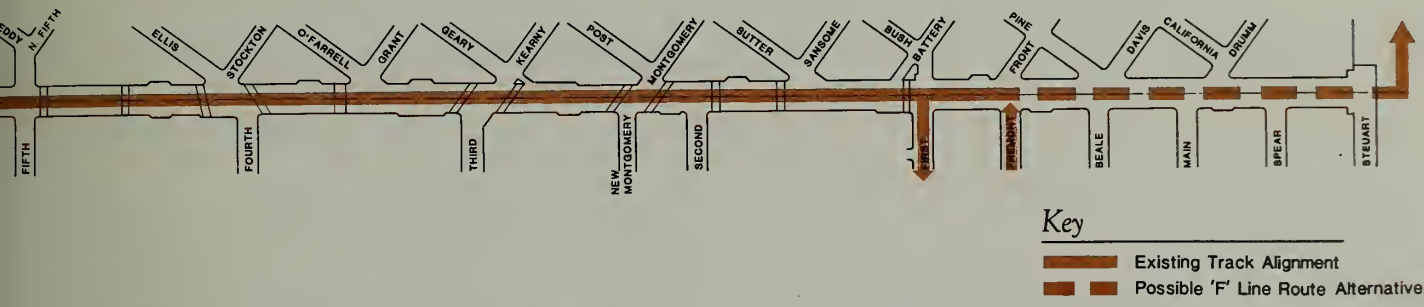
- Improved surface transportation along and between Market Street and the developing northeastern waterfront, with built-in capacity for growth.
- Some relief to the overcrowded cable car lines by diverting people who would enjoy the historic flavor of the streetcars for trips between downtown and Fishermans Wharf.
- Maintenance of surface rail access to downtown in the event of scheduled or unscheduled shutdown of the Market Street subway.

Muni Planning projects that over 23,000* daily riders would use the E/F streetcars initially, with a capacity to absorb nearly twice as many. This compares with 20,000 daily riders on the Powell-Mason cable car, for instance.

Operation

Muni estimates that a schedule which calls for 7-1/2 minute headways (8 cars per hour per direction) would be sufficient during the 12 hours (7 to 7) of greatest demand, dropping back to 15 minute headways for the remaining 8 hours of the operating day. A round trip running time of 92 minutes* is based on the current 8-Market and 32-Embarcadero schedules.

*This assumes a western terminus at Castro/ Market, and an eastern terminus at Pier 39.



Initially, 13 vehicles would be required to operate along the E/F route. Two spares mean a total fleet of 15 streetcars. Muni figures indicate 225 vehicle hours of daily operation under this plan, or just over 82,000 vehicle hours per year.

It is further assumed for operations and financial planning purposes that an E/F streetcar would substitute for part or all of existing bus and trolley services which duplicate the proposed streetcar route (i.e., 8-Market trolley, 32-Embarcadero bus).

Route

Designation of the 'F' Line's alignment east of the existing Transbay Terminal loop is effectively being addressed within the context of the I-280 Transfer Concept Program. A track "interconnection" between the 'E' Embarcadero and 'F' Market lines, pursuant to Res. 160-83, is being evaluated as one element of the I-280 Project. The City's Technical Advisory Committee for I-280 has tentatively recommended an 'F' Line alignment east along Market from First/Fremont to Steuart, then south along Steuart and east through Muni's trolley lot to the median of a rebuilt Embarcadero roadway. 'F' Line streetcars would then proceed north along 'E' Line tracks.

All remaining track segments already exist on Market Street between Fremont and Seventh (as well as west to Duboce), and need only be replaced in accordance with the street redesign plan.

Agreement has yet to be reached with respect to three 'F' Line route issues:

1. Retention and alignment of tracks on Market Street west of the Civic Center, with or without provision for revenue service (e.g., boarding islands).

2. Location and track access to one or more western termini (west of Seventh) for revenue service operations.

3. Provision for and access to a streetcar maintenance and storage facility.

Capital Elements

Implementation of the 'F' Market streetcar service requires four basic capital initiatives:

- Track reconstruction and realignment, installation of boarding islands and repaving along existing streetcar right-of-way from Fremont Street west to at least the Civic Center vicinity (say Van Ness Avenue); track reconstruction further west awaits determination of other issues.

- Construction of new track, overhead, boarding islands and related street work on Market Street required to provide a service connection with the 'E' Embarcadero streetcar line. (May require environmental assessment.)

- Necessary access trackage to and development of a streetcar storage area capable of light maintenance, cleaning, etc. (May require environmental assessment.)

- Acquisition and/or rehabilitation of historic streetcars capable of providing sustained, reliable revenue service.

Additional capital elements which may or may not be required, consistent with ongoing analysis:

- Realignment of existing track on Market Street west of Civic Center consistent with revised street geometrics

- Construction of new track on Market between Duboce and Church, bypassing Metro's Duboce subway portal. (May require environmental assessment)

- Construction of boarding islands west of Civic Center

- Construction of new track and terminal(s) within the Civic Center area. (May require environmental assessment)

- Other track and termini facilities on or off Market, as determined

These and other issues will be the subject of continuing discussion and evaluation in Phase II of the Market Street Planning Project, resulting in a recommended long term plan for 'F' Line streetcar operations.

Project Financing

Capital Costs

1984-85 $ ESTIMATES	Plan Alternatives A	Plan Alternatives B
o Demolition	$ 1,751,000	$ 742,000
o Traffic Control	555,000	555,000
o Sidewalk Modification	68,000	316,000
o Streetcar Track Installation	3,987,000	1,779,000
Relocate Existing Curbside Street Elements[2]	209,000	343,000
o Surfacing	4,893,000	4,330,000
o Loading Islands	1,281,000	1,281,000
o Bus Shelters[3]	485,000	485,000
ITEMIZED CONSTRUCTION COSTS	$13,229,000	$ 9,831,000
Itemized Construction Costs:		
o General Conditions (20% of Itemized Cost)	$ 2,646,000	$ 1,966,000
o Contingencies (10% of Itemized Cost)	1,323,000	983,000
SUB-TOTAL, CONSTRUCTION	$17,198,000	$12,780,000
o Contractor Overhead/Profit (15% of Construction)	$ 2,579,000	$ 1,917,000
TOTAL CONSTRUCTION COST:	$19,777,000	$14,697,000
o Engineering/Construction & Project Management (18% of Construction)	$ 3,560,000	$ 2,645,000
TOTAL PROJECT:	$23,337,000	$17,342,000

Notes

1. Costs derive from Market Street Design Planning Study (June 1982) for Plan Alternatives 'A' and 'B' -- alternatives which retain tracks on Market Street. Alt. A presumes all new track; Alt. B preserves track installed by BART over the Montgomery, Powell and Civic Center subway stations.

2. Fremont to 7th Street only.

3. Assumes "revising" the existing 27 'T' shelters in their present locations.

Source: Market Street Design Planning Study (June 1982), DKS Associates.

The Market Street Design Planning Study produced capital cost estimates in its 1982 report for the reconstruction of lower Market Street and for the replacement of streetcar tracks between Fremont and Twelfth Streets. These costs have been updated to 1984-85 dollars as shown.

The project scope at that time, however, was necessarily limited under terms of the consultant contract. In order to fully reflect anticipated project costs therefore, the following elements have been added and will be evaluated during the course of the Market Street Planning Project:

- Relocation costs for utilities and other subsurface structures, if any
- Streetcar acquisition/rehabilitation costs
- Site and construction costs for a streetcar storage/maintenance facility and necessary access trackage
- Cost of additional track work on or off Market Street beyond stated limits, including any terminus facilities
- Transit shelter replacement and relocation
- Other street element revisions

All project elements will be individually recosted based on current information following the selection of a final design plan recommendation.

Operations and Maintenance

'F' LINE STREETCAR SERVICE
Operating Costs and Revenues
(Annual 1984-85 $'s)

Direct Cost[1]

Alt. Streetcar Termini:	
Castro	$2.6 -4.3 M
Duboce/Church	2.25-3.7 M
Van Ness/Civic Center Area	2.25-3.7 M

Direct Revenue[2]

Alt. Streetcar Termini:		Daily Trips
Castro	$3.4 M	(23,400)
Duboce/Church	2.5 M	(17,400)
Van Ness/Civic Center Area	2.4 M	(15,900)

Net Muni Costs[3]

Alt. Streetcar Termini:	E/F-Streetcar	8-Market	32-Embarc	Total
Castro	$2.6 - 4.3 M	($1.3 M)	($0.55 M)	$0.75-2.45 M
Duboce/Church	2.25 - 3.7 M	($0.39 M)	($0.55 M)	$1.31-2.76 M
Van Ness/Civic Center Area	2.25 - 3.7 M	($0.39 M)	($0.55 M)	$1.31-2.76 M

( ) Indicates net savings.

Notes:

All projections assume a combined E/F streetcar operation, with service scheduled at 7.5 minute headways for 12 hours and 15 minute headways for the remaining 8 hours of the transit operating day. Roundtrip running time is estimated at 92-minutes, based on current 8-Market and 32-Embarcadero running times.

1. Annual cost range based on 1-2 person crews; $32-52 per vehicle-hour consistent with current Historic Trolley Festival operations.
2. Annual revenue based on 40¢ average fare revenue per trip consistent with current 8-Market operations.
3. Streetcar service is assumed to substitute for part or all of existing bus and trolley services which duplicate the proposed E/F streetcar route.

Source: Market Street Technical Criteria (March 28, 1984), Muni Planning.

F-Line Streetcar

The most significant impact on maintenance and operations derives from the introduction of streetcars in regular revenue service. For purposes of estimating these budgetary impacts, Muni Planning has assumed the operations plan discussed on pp. 16 and 17. All projections assume a combined E/F streetcar operation.

Each category shows cost and revenue data for streetcars operating to three alternative western termini along Market Street, an issue yet to be resolved.

Street and Sidewalk Maintenance

Street maintenance budgets for the Department of Public Works will remain at a relatively constant level, notwithstanding one-time infrastructure allocations from the City's recent budget surplus.

DPW representatives note that a substantial portion of damaged street furniture already on Market Street is effectively beyond repair due to a variety of unique features: nonmodular assembly, special coatings which weather poorly, lack of parts availability, among others.

It is arguable given this experience, that the best street design over the long run is one consisting of elements which can be easily and inexpensively maintained in good operating condition.

While street cleaning and maintenance budget recommendations are not within the purview of this project, it is appropriate to actively consider the potential alternatives (e.g., a Benefit Assessment District) capable of sustaining the City's extraordinary investment in its main commercial thoroughfare.

Action Plan

Issue Resolution, Decision

Phase 1 - STREET REDESIGN

Muni Operating Plan

A final determination must be made for relocating curb and island stops to enhance the efficiency and speed of Muni service on Market Street.

Street Geometrics

The Project's most important design variable involves the selection of a street plan for east of Eighth to Steuart -- a plan presumably based on previous DKS Associates analyses.

Retention or replacement of streetcar tracks installed by BART and location of islands are central elements to this choice. Each must weigh impacts on project cost and disruption as well as ultimate street design and functional integrity, among others.

New design alternatives must be developed and recommendations made for the street area west of Eighth to McCoppin, distinguishing between the two existing segments' cross sections:

- Eighth to Twelfth (68-foot cross section)
- Twelfth to McCoppin (88-foot cross section)

Retention and realignment of streetcar tracks and islands west of Eighth will again be primary determinants of the recommended design plan.

Sidewalk/Curb Area

Two major decisions must be made within this issue area:

1. Curb Realignment - The consequences of narrowing sidewalks (e.g., utility relocation, tree removal, pedestrian circulation) need to be carefully examined and serve as feedback to recommendations pertaining to street area design.

2. Crosswalks - Materials and installation techniques must be recommended for completing remaining crosswalks to existing design patterns in keeping with minimum maintenance objectives.

Boarding Islands

Probably the single most controversial issue, a decision is required on whether to design islands with pedestrian barriers and corresponding impact attenuators for motorists, or to incorporate only "passive" safeguards. Safety must be evaluated from a total street perspective.

Street Furniture

The principal street furniture issue to be decided is between remodelling and in some cases relocating existing 'T' shelters to Muni curb stops, or acquiring new custom designed shelters.

Phase 2 - 'F' LINE STREETCAR

Function

Market Street F-Line streetcars can serve one of two basic transportation functions. A policy decision on this issue is needed as a prerequisite to all other aspects of system design and operation.

1. "Downtown People Mover" Muni service
   - Market Street Corridor: Embarcadero - Civic Center
   - Market Street Corridor-N.E. Waterfront Corridor (via E-Line tracks)
2. In addition to (1), radial Muni service
   - Upper Market Street neighborhoods
   - Others (e.g., Mission Bay)

Operation

A detailed operating plan must be developed consistent with the 'F' Line's function, capable of generating accurate patronage, scheduling, staffing, maintenance and financial information.

Route

The overall F-Line route will derive from policy decisions regarding service function. Specific track alignment recommendations will incorporate a variety of additional factors and related projects.

Capital Elements

Project definition of all capital elements will derive, in turn, from F-Line operating and route parameters. Recommendations for six major components need to be developed:

- Revenue trackage
- Traction power system
- Islands and terminals
- Maintenance/storage facility and access trackage
- Rolling stock (streetcars)
- All related street, sidewalk and utility work

Environmental Assessment

Separate analyses as required under State (CEQA) and Federal (NEPA) statutes must be determined and initiated.

PROJECT FINANCING

All of the Phase 1 and Phase 2 policy, design and other planning decisions must supply the basis for capital and operating cost estimation. To be developed in conjunction with preliminary engineering feasibility analyses, these will provide feedback during the course of project planning.

A financial plan describing anticipated sources of funding will be developed corresponding to projected capital and operating costs as the final planning step.

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